

What Is Claimed Is:

1. A method for providing a light emitting component with a predetermined input impedance comprising:

providing a light emitting element disposed on a substrate;

providing an impedance circuit disposed on the substrate that is coupled to the light emitting element;

adjusting an impedance of the impedance circuit so that the equivalent input impedance of the light emitting component is set to the predetermined value.

2. The method of claim 1 further comprising determining the impedance of the light emitting element.

3. The method of claim 1 further comprising determining the impedance of the light emitting component.

4. The method of claim 1 wherein the providing an impedance circuit includes providing an adjustable resistor.

5. The method of claim 4 wherein the adjusting further comprises adjusting a resistance value of the adjustable resistor.

6. The method of claim 1 wherein the adjusting further comprises adjusting the input impedance of the light emitting component such that the input impedance is substantially resistive.

7. The method of claim 1 wherein the providing an impedance circuit includes providing an adjustable inductor.

8 ~~9~~. The method of claim 8 wherein the adjusting further comprises adjusting an inductance value of the adjustable inductor.

9 ~~10~~. The method of claim 1 wherein said providing an impedance circuit includes providing an adjustable capacitor.

10 ~~11~~. The method of claim 10 wherein the adjusting further comprises adjusting a capacitance value of the adjustable capacitor.

11 ~~12~~. The method of claim 1 wherein the adjusting further comprises adjusting the impedance of the impedance circuit to substantially compensate for a reactive impedance associated with the light emitting element so that the equivalent input impedance of the light emitting component is substantially resistive.

~~12~~ 13. The method of claim 1 characterized by the use of a vertical cavity surface emitting laser (VCSEL) as the light emitting element.

~~13~~ 14. The method of claim 12 wherein the adjusting further comprises trimming circuit components in the network.

~~14~~ 15. A method for providing a light emitting component having an input impedance that substantially matches a characteristic impedance of a transmission line comprising:

providing a light emitting element disposed on a substrate;

providing an impedance circuit disposed on the substrate that is coupled to the light emitting element;

adjusting an impedance of the impedance circuit so that the input impedance of the light emitting component substantially matches the characteristic impedance of the transmission line.

~~15~~ 16. A method for providing a light emitting component having an input impedance that substantially matches an output impedance of a driver circuit comprising:

providing a light emitting element disposed on a substrate;

providing a variable impedance circuit

disposed on the substrate that is coupled to the light emitting element;

adjusting an impedance of the impedance circuit so that the input impedance of the light emitting component substantially matches the output impedance of the driver circuit.

16 17. A method for obtaining a desired frequency response from a light emitting element disposed on a substrate comprising:

determining the desired frequency response of the light emitting element to an input signal;

providing a network with a variable transfer function coupled to the light emitting element and disposed on the substrate; and

adjusting the transfer function of the network to obtain the desired frequency response from the light emitting element.

17 18. The method of claim 17 wherein the transfer function is adjusted to optimize bandwidth of the light emitting element.

18 19. The method of claim 17 wherein the transfer function is adjusted to optimize high frequency response of the light emitting element.

19 ~~20~~. The method of claim 17 wherein the providing includes providing an adjustable resistor in the network.

20 ~~21~~. The method of claim 20 wherein the adjusting further comprises adjusting a resistance value of the adjustable resistor.

21 ~~22~~. The method of claim 17 wherein the providing includes providing an adjustable inductor in the network.

22 ~~23~~. The method of claim 22 wherein the adjusting further comprises adjusting an inductance value of the adjustable inductor.

23 ~~24~~. The method of claim 17 wherein the providing includes providing an adjustable capacitor in the network.

24 ~~25~~. The method of claim 24 wherein the adjusting further comprises adjusting a capacitance value of the adjustable capacitor.

25 ~~26~~. The method of claim 17 wherein the adjusting further comprises trimming circuit components in the network.

27 27. A light emitting component comprising:
a light emitting element disposed on a
substrate for emitting light; and
an impedance network disposed on the
substrate and coupled to the light emitting circuit.

28 28. The light emitting component of claim 27
wherein the light emitting element is a vertical cavity
surface emitting laser (VCSEL).

29 29. The light emitting component of claim 27
wherein the impedance network includes a resistor.

30 30. The light emitting component of claim 29
wherein the resistor is adjustable.

31 31. The light emitting component of claim 27
wherein the impedance network includes a capacitor.

32 32. The light emitting component of claim 31
wherein the capacitor is adjustable.

33 33. The light emitting component of claim 27
wherein the impedance network includes an inductor.

34 34. The light emitting component of claim 33
wherein the inductor is adjustable.

34 ~~35~~. The circuit defined in claim 27 wherein the impedance network is formed, at least in part, from metal disposed on the surface of the substrate.

35 ~~36~~. The light emitting component of claim 27 wherein the impedance network is adjustable by an end-item user.

36 ~~37~~. The light emitting component of claim 27 wherein the impedance network is adjustable at the wafer level.

37 ~~38~~. The light emitting component of claim 27 wherein the impedance network is adjustable at the optical subassembly level.

38 ~~39~~. The light emitting component of claim 27 wherein the impedance network is adjustable at the module level.

39 ~~40~~. The light emitting component of claim 27 further comprising circuitry for establishing a current threshold of the light emitting component.

40 ~~41~~. The light emitting component of claim 27 further comprising circuitry for adjusting a current threshold of the light emitting component.

41 42. The light emitting component of claim 27 further comprising circuitry for adjusting a slope efficiency of the light emitting component.

42 43. The light emitting component of claim 27 further comprising circuitry for establishing a slope efficiency of the light emitting component.

43 44. A method for obtaining a desired response from a light emitting element disposed on a substrate comprising:

determining the desired response of the light emitting element to an input signal;

providing a network with a variable transfer function coupled to the light emitting element and disposed on the substrate; and

adjusting the transfer function of the network to obtain the desired response from the light emitting element.

44 45. A method of claim 44 wherein the desired response is a desired time domain response, and wherein the adjusting further comprises adjusting the transfer function of the network to obtain the desired time domain response.

45 46. A method of claim 44 wherein the desired response is a predetermined settling time, and wherein the adjusting further comprises adjusting the transfer function of the network to obtain the predetermined

settling time.

46 47. A method of claim 44 wherein the desired response is extended bandwidth, and wherein the adjusting further comprises adjusting the transfer function of the network to obtain the desired extended bandwidth.

48. A method for providing a light emitting component having an input impedance within a predetermined range comprising:

selecting a range of impedance values;

providing a light emitting element disposed on a substrate; and

providing an impedance circuit disposed on the substrate and coupled to the light emitting element so that the input impedance of the light emitting component is within the selected range.